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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/555,657	11/04/2005	Tsumoru Ohata	043888-0412	9671
53080 7590 06/22/2010 MCDERMOTT WILL & EMERY LLP 600 13TH STREET, NW WASHINGTON, DC 20005-3096				
EXAMINER				
LEE, CYNTHIA K				
ART UNIT		PAPER NUMBER		
1795				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

## Application No.

10/555,657

## Applicant(s)

OHATA ET AL.

## Examiner

CYNTHIA LEE

## Art Unit

1795

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 07 May 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1, 4-9, 16-22 and 25-27 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 4-9, 16-22 and 25-27 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB-06)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 5/7/2010 has been entered.

***Response to Amendment***

This Office Action is responsive to the amendment filed 5/7/2010. Claims 1, 4-9, 16-22 and 25-27 are pending.

Applicant's arguments have been fully considered, but are not persuasive. Claims 1, 4-9, 16-22, and 25-27 are non-finally rejected for the reasons of record.

***Claims Analysis***

To avoid 35 USC 112, 2<sup>nd</sup> paragraph issues, the limitation "indefinite-shape particle" has been defined as "shapes having knots, bumps, or bulges based on the primary particles, that is, for example, shapes like dendrite, grape clusters, or coral, unlike shapes that are spherical or egg-shaped, or that are similar to such shapes" as supported by the Specification pg 5 paragraph [0009].

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 4-6, 9, 16-22 and 25 are rejected under 35 U.S.C. 103(a) as being obvious over Delnik (US 5948464), as evidenced by Walls, et. al., (Fumed silica-based composite polymer electrolytes: synthesis, rheology, and electrochemistry, Journal of Power Sources 89 (2000) 156-162).

Delnik discloses a secondary battery comprising a positive electrode, a negative electrode, a separator (applicant's porous electron-insulating layer) adhered to the anode and cathode. See fig. 1. A separator is present comprising a fine porous film. The precursor separator solution comprises silica filler and a polymer binder (see Abstract). The separator comprises indefinite-shape particles comprising shapes of dendrites, grape clusters, or coral. See Fig. 2.

Regarding the limitation "a neck is formed between at least a pair of said single crystalline particles, said neck comprising the same material as said single crystalline particles", Delnick discloses of using fumed silica (Delnick's claim 5). It is noted that fumed silica consists of fused silica particles. See Walls, pgs 156. Thus, the fumed silica particles of Delnick inherently have indefinite shapes with "neck comprising the same material as said single crystalline particles" as claimed by Applicant.

Regarding claims 4 and 17, Delnick discloses that the particle size is between 0.01 um and 1.0 um (6:67). It is noted that an aggregation of several particles would

results in "a primary particle" size of no more than 10  $\mu\text{m}$ . As long as there is at least one agglomerate that has less than 10 particles in a linear fashion, it meets the claim.

Regarding claims 1 and 16, Delnick does not expressly disclose the porosity of the separator. Delnick discloses that the separator is a liquid-electrolyte-permeable separator, which comprises a matrix of solid particulate material which permits liquid electrolyte to permeate the layer of solid particulate material (5:25-27). Delnick further discloses that the binder in the separator ink works like an adhesive that adheres individual filler particles to each other, leaving the interstices between the particles open (8:25-27). It would have been obvious to one of ordinary skill in the art at the time the invention was made to vary the amount of open interstices for the benefit of allowing the electrolyte to permeate the separator. Delnick clearly teaches that leaving the interstices open is a result effective variable. It has been held by the courts that discovering an optimum value or workable ranges of a result-effective variable involves only routine skill in the art, and thus not novel. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). See MPEP 2144.05.

Claims 1, 5, 16, 18, 26 and 27 are rejected 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Gozdz (US 5571634), as evidenced by Walls, et. al., (Fumed silica-based composite polymer electrolytes: synthesis, rheology, and electrochemistry, *Journal of Power Sources* 89 (2000) 156-162).

Gozdz discloses a secondary battery comprising a positive electrode, a negative electrode, a separator (applicant's porous electron-insulating layer) adhered to the anode and cathode. See fig 1. The precursor separator solution comprises fumed silica filler and a DBP (Applicant's polymer binder) (3:50-65).

Regarding the limitation "indefinite-shape particles comprising shapes of dendrites, grape clusters, or coral" and "a neck is formed between at least a pair of said single crystalline particles, said neck comprising the same material as said single crystalline particles", Gozdz discloses of using fumed silica or fumed alumina (3:57 and 4:10). It is noted that fumed silica consists of fused silica particles. See Walls, pgs 156. Thus, the fumed silica and fumed alumina fillers of Gozdz inherently have indefinite shapes with "neck comprising the same material as said single crystalline particles" as claimed by Applicant.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 8 is rejected under 35 U.S.C. 103(a) as obvious over Delnik (US 5948464) as applied to claim 1.

Delnik discloses all the elements of claims 1 and 16 and are incorporated herein. Delnik discloses that for a lithium-ion cell, the electrodes can be made of oxides and the

anode is made of carbon (9:29-33). Delnik does not disclose that the lithium-ion battery comprises a non-aqueous electrolyte and a lithium salt. The Examiner notes that a lithium-ion battery commonly contains a non-aqueous solvent and a lithium salt in the solvent. It would have been obvious to one of ordinary skill in the art at the time the invention was made to add a non-aqueous solvent and a lithium salt in the solvent to make a complete circuit in the battery.

Claims 7 and 20 are rejected under 35 U.S.C. 103(a) as obvious over Delnik (US 5948464) as applied to claims 1 and 16, in view of Waterhouse (US 4363856).

Delnik discloses all the elements of claims 1 and 16 and are incorporated herein. Delnik does not disclose that the resin binder comprises a polyacrylic acid derivative. Delnik discloses that the resin comprises PVC, PVdF, and EPDM resin (7:5-15). However, Waterhouse teaches of using acrylic acid as a binder for the separator (3:35). It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute acrylic acid of Waterhouse for Delnik's resin because it has been held by the court that the selection of a known material based on its suitability for its intended use is *prima facie* obvious. *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945). See MPEP 2144.07.

### ***Response to Arguments***

Applicant's arguments filed 5/7/2010 have been fully considered but they are not persuasive.

Regarding Applicant's arguments to Day and Khan on pg 8 of Arguments, the Examiner maintains her position that Walls discloses that fumed silica particles comprise "fused particles" and Day discloses (2:45) that "the spheroids are agglomerated in such a way that they form a backbone with branching dendritic structures" (emphasis added). Thus, both Walls et. al. and Day disclose a neck formation with "neck comprising the same material as said single crystalline particles".

Regarding Applicant's arguments regarding the definition of "diffusion bonding" as provided by Applicants on pg 8 of Arguments, it is noted that "fused silica" of prior art meets the limitation "diffusion bonding" of claim 16.

Regarding Applicant's argument regarding porosity on pgs 8-9 of Arguments, it is noted that porosity is not the "number of interstices" as argued by the Applicant, but the state of being porous, and thus Delnick clearly teaches that porosity is a result-effective variable. See rejection above.

Applicant argues that prior art does not disclose the indefinite-shape particle has a size not more than 10 um as required by claim 4 (pg 11-12 of Arguments). In response, Delnick discloses that the particle size is between 0.01 um and 1.0 um (6:67). Thus, when several particles are taken together, as long as there is at least one agglomerate that has less than 10 particles in a linear fashion, it meets the claim.



Applicant argues that there is not suggestion of the claimed porosity, or any effect of porosity on low-temperature, high rate discharge in Delnick or Gozdz (pg 12 of Arguments). In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., any effect of porosity on low-temperature, high rate discharge) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cynthia Lee whose telephone number is 571-272-8699. The examiner can normally be reached on Monday-Friday 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Cynthia Lee/  
Examiner, Art Unit 1795